compromising on the quality or excessively increasing the manufacturing difficulty and related costs.

Another feature, which, as may be easily guessed, affects the quality of the inspecting operation results, concerns the actual acquiring system.

Normally, the support image is acquired through electronic cameras; in particular line scan cameras performing a line-by-line scanning of each support.

Image acquisition may be performed basically using two techniques: by reflection or by transparency, depending on which security support feature is to be scanned and tested.

In a reflection system, the camera and the light source are placed on the same side relative to the support to be inspected, as shown in Fig. 1.

As it can be seen in the figure, a light source 1, through a wave-guide system (for example fibre optics) 2 and a collimation device 3, projects a bright band 1a focussed onto a support 4 to be inspected (also called target). On the same side of the lighting system there is also an acquisition camera 5, "reading" the light reflected by the support in order to transform it into an analogical or digital signal to be analysed with known techniques.

By varying the relative angle of the camera and of the lighting system relative to the support 4, it is possible to acquire images in different conditions, i.e. with specularly reflected light or with diffused light.

This arrangement is used to inspect features on the recto and verso of a support, such as a banknote.

In a transmitted light system, on the other hand, the camera and the lighting device are placed substantially opposite to each other relative to the support to be inspected, the latter being made to pass between the former. This arrangement is used to transparency-inspect specific features, such as watermarks, security threads and so on.

Some of the drawbacks afflicting the prior art systems are indicated below.

The cameras commonly used in this field are black and white or RGB line scan cameras, requiring a simple line of light, of sufficient intensity and quality, to be generated, in order to allow a correct acquisition. The quantity and quality of the light is a critical factor in this type of appliances, due to the high support transportation

CLAIMS

1) Inspecting system for thin security supports, of the type wherein a transportation device is apt to transport said thin support past an image acquiring device, characterised in that said transportation device is a rotating cylinder provided with transparent sectors of a size at least equal to that of the portion of the security support to be inspected and in that a transparency inspecting device is placed partially inside and partially outside the cylinder so that the electromagnetic inspecting beam is intercepted by said supports held lying onto said transparent sectors.

2) Inspecting system as in claim 1), wherein said transparent sectors are covered, on the security support bearing side, by a thin removable transparent protective layer.

3) Inspecting system as in claim 1) or 2), wherein said transportation cylinder comprises a gripping system for said security support having a pivoting gripping element cooperating with an at least radially a movable block, the gripping point of the security support being able to be lowered relative to the nominal rotational diameter thereof so as not to interfere with calibration blades fixedly placed in proximity of the inspection axis and strictly adjacent to said rotating cylinder.

4) Inspecting system as in any of the preceding claims, wherein an optical pattern is defined between an illuminating device of said inspecting system and an acquisition camera, through which said thin security support is made to pass as a target, along the optical pattern upstream of the focal point on the target, shading means being provided apt to define a cone of shade only in correspondence of sensitive elements of said camera.

5) Inspecting system as in claim 4), wherein said shading means is a semitransparent material layer due to which, in the absence of a target to be inspected, said camera does not exceed the saturation threshold which would otherwise corrupt the quality of the image.

6) Inspecting system as in claim 5), wherein said semitransparent material is easily replaceable.

7) Inspecting system as in claims 5) or 6), wherein said semitransparent material, in the absence of a target, allows the camera at most to reach but not

exceed the saturation threshold.

8) Inspecting system as in any one of the claims 4) to 7), wherein said shading means is so transparent and sized as not to absorb more than 10% of the light intensity hitting the target.

9) Inspecting system as in any one of the claims 4) to 8), wherein said illuminating device has reflecting surfaces at its side ends.

10) Transparency inspection system for security supports, of the type wherein an illuminating device is placed at the opposite side of an acquisition camera relative to a support to be inspected, characterised in that said illuminating device is placed substantially on the same optical axis as said acquisition camera and in that it has, along the optical pattern upstream of the focal point on the target, partial-shading means apt to define a cone of shade at camera sensitive elements.

11) Inspecting system as in claim 10), wherein said shading means is a semitransparent material layer such as, in the absence of a target to inspect, said camera does not exceed the saturation threshold, which would otherwise corrupt the quality of the image.

12) Inspecting system as in claim 11), wherein said semitransparent material is easily replaceable.

13) Inspecting system as in claims 11) or 12), wherein said semitransparent material, in the absence of a target, allows the camera at most to reach but not exceed the saturation threshold.

14) Inspecting system as in any one of the claims 10) to 13), wherein said security support is made to pass past the camera adhering to a transportation cylinder having transparent sectors at least at the portion of the support to be inspected, said camera or said illuminating device being fixed inside the transportation cylinder.

15) Method for homogenising the distribution of light on a target in a value sheet inspecting system, of the type comprising the application of a homogenising filter between the light source and the target, characterised in that said filter is made by printing a pattern of more or less spaced and/or wide lines or dots onto a substantially transparent means, on the basis of a previous target reading, performed with said inspecting system.

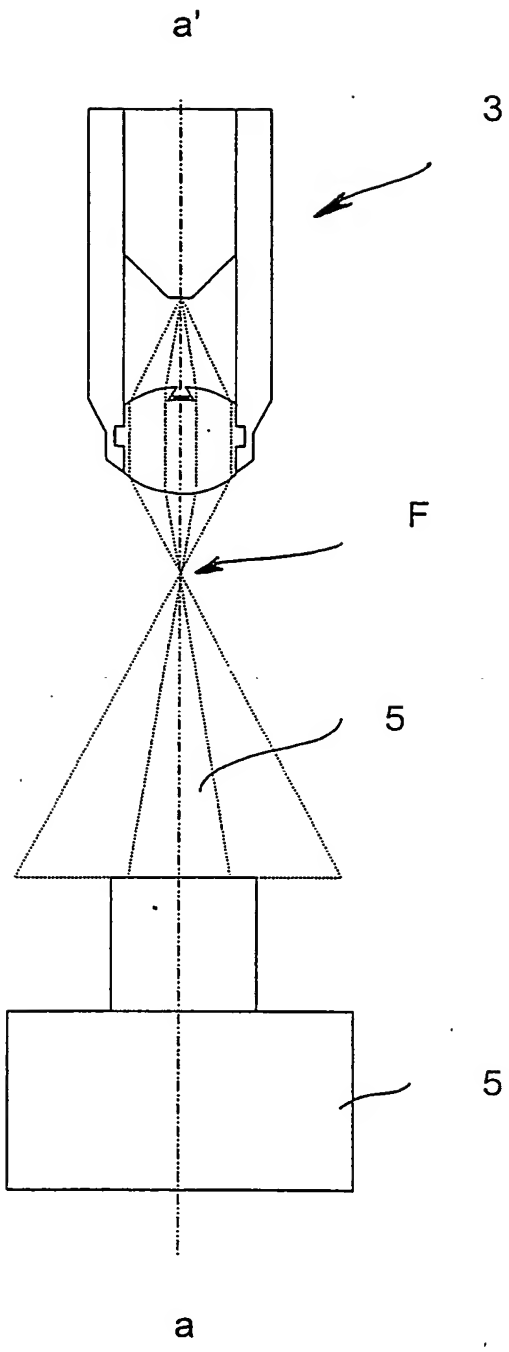


Fig. 4B